OFFICE OF INDIAN AFFAIRS

TRACHOMA

ITS CAUSE, PREVENTION, AND TREATMENT

BY

W. H. HARRISON, M. D.
U. S. INDIAN SERVICE

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TRACHOMA.

Trachoma is one of the chronic and destructive maladies of mankind, destructive not to life, but to the organ of the sense of sight. It has been declared that in untreated trachoma, blindness, or practical blindness, results in 75 per cent of the cases.

This disease appears to exist to a greater or less extent throughout the inhabited world. More recent investigation has proven that it exists where former but more superficial study declared that it did not exist.

In New York City some years ago an examination of all of the school population revealed its presence to an extent hitherto unsuspected, and led to the popular belief that a great and rapid increase in the prevalence of trachoma had overtaken them, when in fact it was the more accurate and extensive knowledge of the conditions resulting from the careful and systematic examination of the children that brought such already existing conditions to light, thus allowing them to be handled with more intelligence and effectiveness.

There are also several localities in the United States where trachoma is found over considerable areas, and involving a certain but comparatively small per cent of the population thereof, in which it is and has been endemic for years, or even generations, and shows no signs of abating, but rather is on the increase. One of these trachomatous districts involves several of the mountain counties of eastern Kentucky and western Virginia. Another comprises southern Illinois, and still another southern Missouri and northern Arkansas. All of the trachomatous districts relate to this disease in whites, and mostly, too, to those whose ancestry for some generations have been Americans.

West of the Mississippi River there are almost as many trachoma districts as there are Indian reservations, Indian schools, or Indian communities.

An examination of the pupils of a large number of the Indian boarding schools, together with a great many thousands of reservation and adult Indians in several States, has demonstrated that trachoma exists among these people to such an extent that if it were measles, whooping cough, scarlet fever, or smallpox its prevalence would be declared an epidemic and panic among the people of these

districts would prevail. Even in some boarding schools such destruction of the cornea by trachomatous ulcers or pannus, or both, has been found in many cases that classroom or other fine or careful work was impossible, to say nothing of the same and even worse conditions found among large numbers of old and reservation Indians. No school has been found in my work wholly free from trachoma, and one boarding school in Oklahoma was visited where 88 per cent of the children suffered from this disease, and such conditions, the result of trachoma, as corneal scars, pannus, leucoma adherans, posterior synechia, staphyloma, dislocations, and discharged lenses resulting from perforating ulcers bore ample evidence of the length of time that it had existed, and of its severity, with also the showing that inadequate medical attention had been given these people. It is true (as demonstrated on the Nez Perce Reservation in Idaho) that many reservation Indians refuse to allow the physicians an opportunity to relieve them, but in the schools such conditions do not obtain, and the children should and usually do receive good or fair treatment for trachoma and kindred eye troubles.

Trachoma is evidently a chronic, specific infection of the conjunctiva, characterized by the increase of adenoid tissue in the granules and papillæ, together with hypertrophy of this tissue, resulting, as cure of the specific process abates, in the formation of scar tissue, which appears to bear a definite relation in amount to the height of the hypertrophy (Fuchs).

There may be and doubtless are cases of acute trachoma, but thus far none has come under my observation, and cases so exhibited are recognized as chronic by the presence of hypertrophy of the conjunctiva and usually by scar tissue. It, however, is a disease of exacerbations and remissions, and it is not infrequent to see cases in such periods of exacerbation alluded to as acute trachoma. The early stages of trachoma may be without noticeable irritative symptoms, and one such period of added activity is usually designated by the patient as the beginning of his eye malady. It is not infrequent that the eyes of persons are examined and the abundance of scar tissue present makes it almost certain that trachoma has existed in such eyes to a severe and somewhat destructive degree, and recovered without the patient's ever having known that he had any eye disease. This happy course and termination of trachoma are, of course, rare; but such cases are found, and I have seen several such in both Indian and white patients.

In determining the presence or absence of trachoma it is essential that both lower and upper lids be completely everted, and that all the conjunctiva be carefully inspected, or at least that this procedure should be carried out in all cases in which a simple eversion does not render the diagnosis evident. In a large number of cases of

trachoma of not too long standing a simple eversion will reveal nothing abnormal, but by bringing the retrotarsal fold fully into view one after a little experience can make the diagnosis very easily in most cases. A number of clinical demonstrations to those not familiar with its appearance will very greatly facilitate the recognition of this disease.

In the normal lid, whose appearance should be familiar in all its variations to those examining for trachoma, one notes the pinkish pale conjunctiva on the palpebral surface of the everted upper lid, the blood vessels of which are plainly visible through the translucent conjunctiva, and it will be noted that they run mainly in a vertical direction. When the retrotarsal folds of a normal lid are brought fully into view, the presence of the vessels there will be as readily and easily noted as are those of the palpebral conjunctiva, but in this location a very great tortuosity of these vessels is seen. In trachoma, even if of but slight degree, these vessels are obscured. It will also be noted that the hypertrophied conjunctiva of this region presents the appearance of a tissue in a state of passive congestion.

In the early stages of this disease it may be impossible at first to say definitely whether the case is one of trachoma or some other conjunctival affection. Time and the therapeutic test, i. e., treatment suitable to simple and purulent conjunctivitis, may be necessary to definitely decide the diagnosis of the case.

In my experience, until complications arise, there are few or no symptoms that the patient recognizes of sufficient severity to cause him to consult his physician, but when pannus encroaches into his field of vision, or ulcers cause pain or iritis, his attention is then forcibly directed to his eye condition, and with white patients relief is sought, as is usual also with most Indian patients, although when in this dangerous and deplorable condition some reservation Indians refuse the offer of assistance from the physician.

Of course, the communicability of trachoma, to one with a large experience, goes without argument, and the ideal way to eradicate it would be to prevent its transfer to new patients, thus letting the infection cease to exist with the passing of those now infected; but such ideal prophylaxis seems to be a long way in the future, so far as the Indian is concerned. Probably in no other chronic disease, except tuberculosis, is greater care and intelligence required to bring about complete prophylaxis than is necessary in the presence of the trachoma infection. While there are always a few individuals who live for years or even a lifetime in the homes of those suffering from trachoma without contracting the disease, this is the exception and not the rule, and constant caution to see that individual toilet articles are used is necessary to a successful prophylaxis. Where there is no trachoma, none can possibly develop, and even in the presence of

trachoma it is not possible to contract the disease except some secretion carrying the infection from a trachomatous eye to one not infected is brought into contact with the healthy conjunctiva.

Having reached the diagnosis of trachoma, the procedures necessary to restore the conjunctiva to the normal, or as nearly the normal as the existing state of the malady will permit with the least possible inconvenience to the patient and with the best results, are the ones that should engage our attention. The initiation of treatment will be modified by the stage of the disease, the condition as to activity or quiescence, or whether the case is one of simple trachoma or is influenced by some additional infection. If the case is suitable for expression, and practically all are improved by this procedure, it should antedate all other measures in its treatment; but if there are acute symptoms of added infection, corneal abrasions or ulcers, iritis, or any other irritative conditions present, the necessary and appropriate treatment for any such conditions should be fully carried out until no irritative or inflammatory symptoms exist before expression should be attempted. When the eye is free from any or all of the above-described complications the whole of the trachomatous conjunctiva should be expressed by the use of any one of the many good expression forceps now in use. I have used rather extensively those of Noyes, Knapp, Khunt, and Prince, with a preference in the majority of cases for those of Knapp, of the original model and with very small rollers. With these forceps, which involves the principle of the fluted roller, quite thorough expression may be done and no laceration of the conjunctiva produced, provided care and judgment mark the course of the expression. In a certain small number of old and long-standing cases of trachoma there develops a very fragile, gelatinous hypertrophy of the conjunctiva in which the ordinary roller or any other pulling forceps produces considerable laceration or even completely detaches the conjunctiva, in which the Khunt expressor removes the gelatinous hypertrophy completely without this unhappy result.

To so anæsthetize the conjunctiva that expression will be painless, or practically so, is the ideal toward which those engaged in trachoma work should strive. After several thousand expressions I use as a routine the following method:

After having thoroughly cleaned the skin of the lids, brow, and face, and thoroughly flushing the conjunctival sac with a 2 per cent boric acid or normal salt solution, the upper and lower lids are completely everted and the nurse or attendant places three drops of a 4 per cent solution of cocaine upon the conjunctival surface of the upper lid, and just as this cocaine solution flows over the lower (everted) margin of the superior tarsus the everted inferior tarsus is pushed upward behind the superior lid, completely to the upper

extremity of the fornix, thus bringing the cocaine solution into contact with all the mucous membrane folds of this region. The lids are allowed to assume their normal position and are covered with a small pledget of cotton in order that the patient may keep them closed during the anæsthetizing process. In four minutes from the time the 4 per cent solution of cocaine is placed upon the conjunctiva the lids are everted as before and the assistant places three drops of a 10 per cent solution of cocaine upon the conjunctival surface of the everted upper lid, and with the inferior lid the muscous membrane of the fornix is anæsthetized as before. The 10 per cent solution is repeated at four-minute intervals until, in most cases, four applications of the 10 per cent solution are made, when a wait of three or four minutes from the last application will bring almost complete anæsthesia to the whole of the conjunctival surface and expression may be done with practically no pain, but of course there is a disagreeable sensation of tugging as a result of grasping the lids with the expression forceps.

Expression should be thoroughly done by everting the lower lid first, if it need expression, which it does not in fully two-thirds of the cases, and while the inferior edge of the lower lid tarsus is everted and looks directly up, one blade of the selected forceps is placed directly in the depths of the inferior conjunctival sulcus against the sclera, and the other and outer blade is passed over the palpebral surface of the everted lower lid almost, or quite, to the ciliary margin, and the forceps is closed with considerable firmness and traction made directly up or at right angles to the conjunctival sulcus, until the blades of the forceps have passed out and are free from all engaged tissue. The forceps should be moved laterally the width of its engaging surface, and the process repeated until the whole of the conjunctiva has been stripped of the trachomatous material, when the lid is allowed to assume its normal position and that of expression of the upper lid engages our attention. The upper lid is everted, and if the patient can be induced to look down or toward his feet it greatly facilitates the procedure. Pass the posterior blade of the forceps into the very depths of the fornix and the anterior blade up to or almost to the ciliary margin of the everted lid, when the blades should be closed with appropriate firmness and traction made in the line of the superior tarsus until all tissue engaged in the blades of the forceps has passed through them and the blades are free. Move the forceps laterally the width of the engaging surface of the blade, and repeat until all of the trachomatous conjunctiva has passed between the blades of the forceps and the conjunctiva gives evidence of such smoothing and depleting process. At this stage of the procedure the lids should be everted and all blood and débris thoroughly flushed from them

by boric acid or normal salt solution, when pledgets of cotton or other heat-holding material, wrung from water of the temperature of 110° or 115° F., should be placed upon the closed lids of the expressed eye and renewed at minute or two-minute intervals for 20 to 30 minutes, when all discomfort and pain from the expression will have passed, and, in the case of small children, their usual games and sports will immediately engage their attention. In an experience of several thousands of such expressions, I have not seen any inflammatory reaction follow, nor have I heard the complaint of roughness and discomfort as when using the iced compresses.

In many cases after expression for some hours there is exuded from the expressed surface a serous material, usually in small amounts, which accumulates in the conjunctival sac, and should be removed by gently wiping it from the lid margin to prevent interference with vision. For four to six mornings after the expression, upon awakening, the lids of the patient will be found glued together, but this gradually ceases, and when this occurs it is the signal for the beginning of the real medical treatment of the disease.

The principal to be exemplified in the treatment and cure of trachoma depends upon the repeated production of an acute, active hyperemia in all the trachomatous conjunctiva at short but regular intervals, and for a long time, or until the whole of the conjunctiva returns to the normal or as near the normal as the past severity and destruction of the disease will permit. The initiation of this acute circulatory activity in the trachomatous conjunctiva is induced by the process of expression above described, changing it from one of a state of passivity to that of activity. To continue the return of the acute and active flushing of all the conjunctiva by the circulatory fluids—blood and lymph—any treatment that will accomplish this will cure trachoma. It will be remembered that all treatments that have ever attained any standing in this disease have been those which have roused the circulation of the conjunctiva and lids to greater activity, so in selecting a therapeutic measure this action and result must be ever kept in mind.

I have given a fair trial to all of the established and recognized modes of treating trachoma, and the best results are obtained by me by the daily application of the smooth copper-sulphate stick passed well up under the everted tarsus, and firmly but gently rubbed over the tarsal conjunctiva. For those who have not used the copper-sulphate stick very extensively it may be well to push the inferior lid well up over the cornea during its application to the superior fornix to act as a cushion for protection to that structure, thus avoiding the dangers of corneal abrasions or ulcers.

By whatever means these daily acute hyperemias are renewed, it is necessary to keep them up until the conjunctiva returns to the

normal. Some cases yield to treatment rather rapidly, and may tentatively be called cured in a few months, while others, which do not appear to be worse, improve very much more slowly, and are cured only after twice or three times as much treatment. My best results have been by the use of the copper sulphate applied daily. This is a very painful and irritating application for six or eight treatments, when the pain and discomfort become less and finally amount to very little.[1]

No one may, with safety to his reputation, prognose the day of recovery from trachoma, but all patients must be informed at the outset, or even before treatment is begun, that a great length of time to effect a cure will be required. With this information beforehand many patients will persevere who otherwise will stop treatment as soon as some relief is obtained and before any real amount of progress is made.

Improvement by the use of any of the above-named procedures is determined by a gradual lessening of the peculiar trachomatous red of the conjunctiva and the gradual return of the conjunctival vessels to view. The progress of the case will be in direct proportion to the disappearance of the trachomatous infiltration, and when it is all gone and the normal appearance of the conjunctiva and vessels remain such for some months after treatments have been stopped we are justified in saying that our trachoma is cured.

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[1] While the Indian Office considers the copper-sulphate treatment for trachoma the treatment par excellence, it has found difficulty in many Indian communities in persuading the Indians to accept this treatment.

Should the carrying out of this method of treatment be universally required of the physicians of the Indian Service, the follow-up treatment of trachoma at many reservations would suffer.

It is the experience of many of the physicians of the service that Indians will readily accept the application of a 10 per cent ointment of copper citrate daily or on alternate days, with a 1 per cent ointment of yellow oxide of mercury when other more severe treatments are refused.

Others are successful with the following: Of a 10 per cent stock solution of copper sulphate in glycerin, 1 drop is taken and mixed with 20 drops of water; use 1 drop in each eye three times daily. Such aqueous solutions should be made fresh every week.

The office does not wish to limit the physicians of the Indian Service to any one form of treatment, but desires that permanent results be obtained and the best method of treatment used possible under existing conditions.

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